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Nonminimal black holes with regular electric field

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Abstract

© 2015 World Scientific Publishing Company. We discuss the problem of identification of coupling constants, which describe interactions between photons and spacetime curvature, using exact regular solutions to the extended equations of the nonminimal Einstein-Maxwell theory. We argue the idea that three nonminimal coupling constants in this theory can be reduced to the single guiding parameter, which plays the role of nonminimal radius. We base our consideration on two examples of exact solutions obtained earlier in our works: the first of them describes a nonminimal spherically symmetric object (star or black hole) with regular radial electric field; the second example represents a nonminimal Dirac-type object (monopole or black hole) with regular metric. We demonstrate that one of the inflexion points of the regular metric function identifies a specific nonminimal radius, thus marking the domain of dominance of nonminimal interactions.

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Keywords

Nonminimal interaction, regular black holes